

Abstract Submitted
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Unbound states of ^{32}Cl studied via the $^{32}\text{S}(^3\text{He,t})^{32}\text{Cl}$ charge-exchange reaction M. MATOŠ, LSU, D.W. BARDAYAN, ORNL, J.C. BLACKMON, LSU, J.A. CLARK, ANL, C.M. DEIBEL, ANL, JINA, L. LINHARDT, LSU, C.D. NESARAJA, ORNL, P.D. O'MALLEY, Rutgers, P.D. PARKER, Yale, K.T. SCHMITT, UTK — Breakout from the SiP cycle [1], which is closed by the $^{31}\text{S}(p,\alpha)^{28}\text{P}$ reaction, can occur via the $^{31}\text{S}(p,\gamma)^{32}\text{Cl}$ proton-capture reaction. The duration of the cycle influences the timescale of explosive hydrogen burning. At novae temperatures 0.1-0.4 GK, the $^{31}\text{S}(p,\gamma)^{32}\text{Cl}$ reaction rate is dominated by $^{31}\text{S}+p$ resonances. Discrepancies in the ^{32}Cl resonance energies have been reported in previous measurements [1,2]. We have used the $^{32}\text{S}(^3\text{He,t})^{32}\text{Cl}$ charge-exchange reaction to produce unbound states in ^{32}Cl and determined their excitation energies by detecting the tritons at the focal plane of the Enge Spectrograph at the Yale University's Wright Nuclear Structure Laboratory. To determine the proton branching ratios the decay protons coming from the residual ^{32}Cl nuclei have been detected using a silicon-strip detector array around the target position. Results from the experiment will be presented.

[1] S.Vouzoukas et al., PRC 50 (1994) 1185.

[2] C. Jeanperrin et al., NPA 503 (1989) 77.

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